The largest proportion—36 percent—of material moving equipment operators worked in manufacturing. Most of these were industrial truck and tractor operators. Over 33 percent of all material moving equipment operators worked in transportation, public utilities, wholesale trade or retail trade industries. Significant numbers of material moving equipment operators also worked in construction, mining, and service industries. A few material moving equipment operators were self-employed.

Material moving equipment operators work in every part of the country. Some work in remote locations on large construction projects, such as highways and dams, or in factory or mining operations.

Training, Other Qualifications, and Advancement

Material moving equipment operators usually learn their skills on the job. Operators need a good sense of balance, distance judgment, and eye-hand-foot coordination. Employers of material moving equipment operators prefer high school graduates, although some equipment may require less education to operate. Mechanical aptitude and high school training in automobile or diesel mechanics are helpful because workers may perform some maintenance on their machines. Experience operating mobile equipment, such as farm tractors or heavy equipment in the Armed Forces, is an asset.

As part of an on-the-job apprenticeship, beginning material moving equipment operators handle light equipment under the guidance of an experienced operator. Later, they may operate heavier equipment such as cranes.

Private vocational schools offer instruction in the operation of certain types of material moving equipment. Completion of such a program may help a person get a job as a trainee or apprentice. However, persons considering such training should check the reputation of the school among employers in the area.

Job Outlook

Employment of material moving equipment operators will increase slower than the average for all occupations through 2008. The expected growth stems from an expanding economy and increased spending on the Nation's infrastructure of highways, bridges, and dams. However, equipment improvements, including the growing automation of material handling in factories and warehouses, continue to raise productivity and moderate the demand for skilled operators. In addition to employment growth in this large occupation, many jobs will open up because of the need to replace experienced workers who transfer to other occupations or leave the labor force.

Job growth for material moving equipment operators largely depends on growth in the industries employing them. Employment of operators in manufacturing will decline in tandem with overall industry employment. Employment in construction will grow faster than the average for all occupations, due to the demand for construction related excavation and loading machine operators who prepare new sites for construction. Employment will also grow rapidly in temporary help organizations and companies that lease equipment.

Growth of industrial truck and tractor operators, the largest occupation in this group, will be slower than the average for all occupations. Growth of industrial truck and tractor operators will be constrained by technological improvements. Some firms use computerized dispatching or onboard data communication devices to enable industrial truck and tractor operators to move and track goods more efficiently. In other firms, industrial trucks and tractors may be replaced by computer-controlled conveyor systems, overhead handling systems, or automated vehicles that do not require operators. Employment of hoist and winch operators will grow slowly and crane and tower operators will have little or no growth as precision computerized controls and robotics automate their work in manufacturing and some other industries.

Both construction and manufacturing are very sensitive to changes in economic conditions, so the number of job openings for operators in these industries may fluctuate from year to year.

Earnings

Median annual earnings of industrial truck and tractor operators were $23,360 in 1998. The middle 50 percent earned between $19,170 and $29,760 a year. The lowest 10 percent earned less than $15,410 and the highest 10 percent earned more than $37,670 a year. Median annual earnings in the industries employing the largest number of industrial truck and tractor operators in 1997 were as follows:

Motor vehicles and equipment	$35,300
Trucking and courier services, except air	26,600
Groceries and related products	22,800
Public warehousing and storage	21,300
Personnel supply services	20,700

Median annual earnings of excavation and loading machine operators were $27,090 in 1998. The middle 50 percent earned between $22,240 and $35,580 a year. The lowest 10 percent earned less than $18,620 and the highest 10 percent earned more than $46,140 a year.

Median annual earnings of crane and tower operators were $30,510 in 1998. The middle 50 percent earned between $24,340 and $38,270 a year. The lowest 10 percent earned less than $20,560 and the highest 10 percent earned more than $46,680 a year.

Median annual earnings of hoist and winch operators were $28,030 in 1998. The middle 50 percent earned between $21,120 and $36,400 a year. The lowest 10 percent earned less than $17,370 and the highest 10 percent earned more than $45,260 a year.

Pay usually is higher in metropolitan areas. Seasonal work may reduce earnings.

Related Occupations

Other workers who operate mechanical equipment include railroad yard workers, truck and bus drivers, construction equipment operators, and farm equipment operators.

Sources of Additional Information

Local State employment service offices may provide information about job opportunities and training programs.

Information on industrial truck and tractor operators is available from:

☛ Industrial Truck Association, 1750 K St. NW., Suite 460, Washington, DC 20006.

☛ Specialized Carriers and Rigging Association, 2750 Prosperity Ave., Suite 620, Fairfax, VA 22301.

Rail Transportation Occupations

(O*NET 97302, 97305, 97308, 97311, 97314, 97317A, 97317B, 97399A, and 97399B)

Significant Points

- Overall employment in the railroad transportation industry is expected to decline due to productivity gains.
- Employment of locomotive engineers and subway and streetcar operators is projected to grow slowly, and in all other rail transportation occupations it is projected to decline.
- Over 8 out of 10 rail transportation workers are members of unions and many have relatively high earnings.

Nature of the Work

More than a century ago, freight and passenger railroads were the ties binding the Nation together and the engine driving the economy. Today, rail transportation remains a vital link in our Nation's transportation network and economy. Railroads deliver thousands of travelers and over 1.8 billion tons of freight to destinations throughout the Nation, while subways and streetcars transport millions of passengers within metropolitan areas.

Locomotive engineers are among the most experienced and skilled workers on the railroad. Locomotive engineers operate large trains carrying cargo and passengers between stations. Most engineers run diesel locomotives, while a few operate electrically powered locomotives.

Before and after each run, engineers check their locomotives for mechanical problems. Minor adjustments are made on the spot, while the engine shop supervisor handles any major problems. Engineers receive starting instructions from conductors and move controls such as throttles and air brakes to drive the locomotive. They monitor gauges and meters that measure speed, amperage, battery charge, and air pressure both in the brake lines and in the main reservoir.

Both on the open road and in the yard, engineers confer with conductors and traffic control center personnel via radiophone to issue or receive information concerning stops, delays, or oncoming trains. They interpret train orders, railroad rules and regulations, and train signals indicating track obstructions, other train movements, and speed limits. They must have a thorough knowledge of the signaling systems, yards, and terminals in addition to their routes. Engineers must be constantly aware of the condition and makeup of their train. This is extremely important because trains react differently to acceleration, braking, and curves, depending on the number of cars, the ratio of empty to loaded cars, and the amount of slack in the train.

Traditionally, freight train crews included either one or two brake operators—one in the locomotive with the engineer and another who rode with the conductor in the rear car. In an effort to reduce costs and take advantage of new technology, most railroads are phasing out *assistant engineers* and *brake operators*. Assistant engineers help monitor locomotive instruments and signals and observe the track for obstructions. Brake operators work under the direction of conductors and do the physical work involved in adding and removing cars at railroad stations and assembling and disassembling trains in railroad yards. Now, most freight trains only use an engineer and a conductor, stationed with the engineer, because new visual instrumentation and monitoring devices have eliminated the need for crewmembers located on the rear of the train.

Railroad conductors coordinate the activities of freight and passenger train crews. Railroad conductors assigned to freight trains review schedules, switching orders, way bills, and shipping records to obtain cargo loading and unloading information. Conductors assigned to passenger trains ensure passenger safety and comfort. They collect tickets and fares, and coordinate crew activities to provide boarding, porter, maid, and meal services. Most passenger trains also employ *assistant conductors* to help collect tickets and assist passengers.

Before a train leaves the terminal, the conductor and engineer discuss instructions received from the dispatcher concerning the train's route, timetable, and cargo. While underway, conductors receive additional information by radio. This may include information about track conditions or instructions to pull off at the next available stop and let another train pass. During the run, conductors use two-way radios and cellular phones to communicate with dispatchers, engineers and conductors of other trains.

Conductors receive information from dispatch or electronic monitoring devices that relay any equipment problems on the train or the rail. They may arrange for defective cars to be removed from the train for repairs at the nearest station or stop. Additionally, alternative routes may be discussed if there is a defect or obstruction on the rail. They inform dispatchers of any problems using a radio or wayside telephone.

Yardmasters coordinate activities of workers engaged in railroad traffic operations. These activities include the makeup or breakup of trains and switching inbound or outbound traffic to a specific section of the line. Some cars are sent to unload their cargo on special tracks, while other cars are moved to other tracks to await assemblage into new trains destined for different cities. Yardmasters tell engineers the make-up of trains and where to move the cars. Computerized switches divert the locomotive or cars to the proper track for coupling and uncoupling.

Other *railroad yard workers* perform a variety of activities such as inspecting couplings and air-hoses. They may operate track switches to route cars to different sections of the yard, signal engineers and set warning signals, or help couple and uncouple rolling stock to make up or break up trains. *Rail yard engineers, dinkey operators, and hostlers* drive switching or other locomotive or small "dinkey" engines within railroad yards, industrial plants, mines and quarries, or construction projects.

In contrast to other rail transportation workers, subway and streetcar operators generally work for public transit authorities instead of railroads. *Subway operators* control trains that transport passengers throughout a city and its suburbs. The trains run on rail-guided tracks in underground tunnels, on the surface or elevated above streets. Operators start, slow, or stop the train and must stay alert to observe signals along the track that indicate when they must slow or stop their train to avoid obstructions or other trains ahead. They also make announcements to riders, may open and close the doors, and ensure that passengers get on and off the subway safely.

To meet predetermined schedules, operators must control the train's speed and the amount of time spent at each station. Increasingly, however, these functions are controlled by computers and not by the operator. When breakdowns or emergencies occur, operators contact their dispatcher or supervisor and may have to evacuate cars.

Streetcar operators drive electric-powered streetcars or trolleys that transport passengers in metropolitan areas. Some tracks may be recessed in city streets or have grade crossings, so operators must observe traffic signals and cope with car and truck traffic. Operators start, slow, and stop their cars so passengers may get on or off with ease. They may collect fares, and issue change and transfers. They also answer questions from passengers concerning fares, schedules, and routes.

Working Conditions

Because trains operate 24 hours a day, 7 days a week, many rail transportation employees often work nights, weekends, and holidays. On

Conductors collect tickets and fares and coordinate boarding, porter, maid, and meal services.

some days, operators work multiple shifts. Seniority usually dictates who receives the more desirable shifts.

Most freight trains are unscheduled, and few workers on these trains have scheduled assignments. Instead, their names are placed on a list and they must await their turn to work. Jobs are usually handed out on short notice and often at odd hours. Because road service personnel often work on trains operating between stations that are hundreds of miles apart, they may spend several nights at a time away from home.

Workers on passenger trains ordinarily have more regular and reliable shifts. The appearance, temperature, and accommodations of the passenger trains are also more comfortable than freight trains.

Freight and yard conductors spend most of their time outdoors in varying weather. The work of operators on local runs, where trains frequently stop at stations to pick up and deliver cars, is physically demanding. Climbing up and down and getting off moving cars is strenuous and can be dangerous.

Employment

Rail transportation workers held 85,000 jobs in 1998—including 33,000 locomotive engineers; 25,000 conductors and yardmasters; and 14,000 brake, signal, and switch operators. Subway and streetcar operators accounted for 3,300 jobs. Railroads employ more than 90 percent of all rail transportation workers. The rest work for State and local governments as subway and streetcar operators, and for mining and manufacturing establishments operating their own locomotives and dinkey engines that move rail cars containing ore, coal, and other bulk materials.

Training, Other Qualifications, and Advancement

Most railroad transportation workers begin as yard laborers, and later may have the opportunity to train for engineer or conductor jobs. Railroads require that applicants have a minimum of a high school diploma or equivalent. Applicants must have good hearing, eyesight, and color vision, as well as good hand-eye coordination, manual dexterity, and mechanical aptitude. Physical stamina is required for brake operator jobs. Employers require railroad transportation job applicants to pass a physical examination and drug and alcohol screening. In addition, under Federal law all members of train crews are subject to random drug and alcohol testing while on duty.

On most railroads, entry-level employees help assemble and disassemble trains in the yard. After these operators gain experience, they may have the opportunity for road assignments, although trains now carry brake operators only when they pick up and drop off a lot of cars en route. On most railroads, new brake operators undergo extensive on-the-job training and classroom instruction, including instruction in signaling, coupling and uncoupling cars, throwing switches, and boarding moving trains.

Applicants for locomotive engineer jobs must be at least 21 years old. Frequently, employers fill engineer positions with workers who have experience in other railroad operating occupations. Federal regulations require beginning engineers to complete a formal engineer training program, including classroom, simulator, and hands-on instruction in locomotive operation. The instruction is usually administered by the rail company. At the end of the training period, they must pass qualifying tests covering locomotive equipment, air brake systems, fuel economy, train handling techniques, and operating rules and regulations. The company issues the engineer a license after the applicant successfully passes the examinations. Other conditions and rules may apply to entry-level engineers, and these rules usually vary between railroads.

Engineers undergo periodic physical examinations and drug and alcohol testing to determine their fitness to operate locomotives. Unannounced safety and efficiency tests are also given to judge their overall conduct of operations. In some cases, engineers who fail to meet these physical and conduct standards are restricted to yard service; in other instances, they may be disciplined, trained to perform other work, or discharged.

Conductor jobs are generally filled from the ranks of experienced brake operators who have passed tests covering signals, timetables, operating rules, and related subjects. Some companies require these tests to be passed within the first 2 years of employment. Seniority usually is the main factor in determining promotion from brake operator to conductor. There is a great deal of competition for conductor positions because their earnings are substantially higher than entry-level occupations. Most railroads maintain separate seniority lists for road service and yard service conductors. On some railroads, conductors start in the yards, then move to freight or passenger service. Some conductors advance to managerial or administrative positions.

Newly trained brake operators, engineers, and conductors, are placed on the "extra board" until permanent positions become available. Extra board workers only receive assignments when the railroad needs substitutes for regular workers who are absent because of vacation, illness, or other personal reasons. On most railroads, conductors on the extra board, for example, may work as brake operators if there are not enough conductor-runs available that month. Extra board workers frequently must wait years until they accumulate enough seniority to get a regular assignment. Seniority rules may also allow workers with greater seniority to select their type of assignment. For example, an engineer may move from an initial regular assignment in yard service to road service.

For subway and streetcar operator jobs, subway transit systems prefer applicants with a high school education. Applicants must also be in good health, have good communication skills, and be able to make quick, responsible judgments.

New operators are generally placed in training programs that last from a few weeks to 6 months. At the end of the period of classroom and on-the-job training, operators usually must pass qualifying examinations covering the operating system, troubleshooting, and evacuation and emergency procedures. Some operators with sufficient seniority can advance to station managers or other supervisory positions.

Job Outlook

Competition for available opportunities is expected to be keen. Many persons qualify for rail transportation occupations because education beyond high school is generally not required. Many more desire employment than can be hired because the pay is good and the work steady.

Employment for a majority of railroad transportation occupations is expected to decline through the year 2008, with only locomotive engineers and subway and streetcar operators expected to grow. The need to replace workers who transfer to other occupations or retire will be the only source of job openings. A limited number of total job openings is expected, because the attractive pay, tenure, and job security results in relatively few rail transportation workers leaving their jobs. In addition, not all the workers who leave the occupations will be replaced, further reducing job openings. The industry continues to reduce its workforce because of productivity gains, mergers, and divestiture-related cutbacks.

Demand for railroad freight service will grow as the economy and the intermodal transportation of goods expand and railroads become more efficient. Intermodal systems use trucks to pick-up and deliver the shippers' sealed trailers or containers, and trains to transport them long distance. This saves customers time and money by efficiently carrying goods across country. Intermodalism is the fastest growing type of railroad transportation. For railroads, the benefit has been the increased efficiency of equipment use, allowing increases in the number of runs each train makes in a year. In order to compete with other modes of transportation such as trucks, ships and barges, and aircraft, railroads are improving delivery times and on-time service while reducing shipping rates.

As a result, businesses are expected to increasingly use railroads to carry their goods.

However, growth in the number of railroad transportation workers will generally be adversely affected by innovations such as larger, faster, more fuel-efficient trains and computerized classification yards that make it possible to move freight more economically. Computers are used to keep track of freight cars, match empty cars with the closest loads, and dispatch trains. Computer-assisted devices alert engineers to train malfunctions and new work rules have become widespread allowing trains to operate with two- or three-person crews instead of the traditional five-person crews. Employment of locomotive and yard engineers should grow as the industry expands to high-speed service in various corridors in the country.

Subway and streetcar operator employment is expected to grow as metropolitan areas build new rail systems and add new lines to existing systems. State and local governments support new construction because population growth in metropolitan areas has increased automobile traffic, making streets and highways more congested. Improved rail systems offer an alternative to automobile transportation that can reduce road congestion and, by reducing automobile use, contribute to government mandated improvements in air quality.

Earnings

Median hourly earnings of locomotive engineers were $19.14 in 1998. The middle 50 percent earned between $15.07 and $23.81 an hour. The lowest 10 percent earned less than $12.22 and the highest 10 percent earned more than $35.65 an hour.

Median hourly earnings of railroad conductors and yardmasters were $18.51 in 1998. The middle 50 percent earned between $16.24 and $23.47 an hour. The lowest 10 percent earned less than $13.60 and the highest 10 percent earned more than $35.27 an hour.

Median hourly earnings of railroad brake, signal, and switch operators were $17.57 in 1998. The middle 50 percent earned between $15.50 and $19.44 an hour. The lowest 10 percent earned less than $12.86 and the highest 10 percent earned more than $24.16 an hour.

Median hourly earnings of subway and streetcar operators were $20.83 in 1998. The middle 50 percent earned between $19.04 and $22.60 an hour. The lowest 10 percent earned less than $16.23 and the highest 10 percent earned more than $23.66 an hour.

Most railroad workers in road service are paid according to miles traveled or hours worked; whichever leads to higher earnings. Full-time employees have steadier work, more regular hours, increased opportunities for overtime work, and higher earnings than do those assigned to the extra board. In 1998, a third of all rail transportation employees worked 40 hours a week. About another third worked in excess of 40-hours and received extra pay for overtime.

According to the National Railroad Labor Conference in 1997, the average annual earnings for engineers ranged from $55,100 for yard-freight engineers, to $69,000 for local-freight engineers. For conductors, earnings ranged from $51,700 for yard-freight conductors, up to $65,200 for passenger conductors. The NRLC reported that brake operators averaged from $42,400 for yard-freight operators, up to $57,700 for local-freight operators.

According to data from the American Public Transit Association, in early 1999 the top-rate full-time hourly earnings of operators for commuter rail ranged from $17.50 to $28.70; operators for heavy rail from $17.50 to $26.00; and operators for light rail from $13.60 to $21.90. Transit workers in the northeastern United States typically had the highest wages.

More than 80 percent of railroad transportation workers are members of unions. Many different railroad unions represent various crafts on the railroads. Most railroad engineers are members of the Brotherhood of Locomotive Engineers, while most other railroad transportation workers are members of the United Transportation Union. Many subway operators are members of the Amalgamated Transit Union, while others belong to the Transport Workers Union of North America.

Sources of Additional Information

To obtain information on employment opportunities for railroad transportation workers, contact the employment offices of the various railroads and rail transit systems, or State employment service offices.

For general information about the rail transportation industry, contact:

☛ Association of American Railroads, 50 F St. NW., Washington, DC 20001. Internet: **http://www.aar.org**.

☛ Federal Railroad Administration, 400 7th St. SW., Washington, DC 20590. Internet: **http://www.fra.dot.gov**

For general information about career opportunities in passenger transportation, contact:

☛ American Public Transit Association, 1201 New York Ave. NW., Suite 400, Washington, DC 20005. Internet: **http://www.apta.com**

General information on rail transportation occupations and career opportunities as a locomotive engineer is available from:

☛ Brotherhood of Locomotive Engineers, 1370 Ontario Ave., Cleveland, OH 44113-1702. Internet: **http://www.ble.org**

For information on certification and training programs, contact:

☛ National Association of Railroad Sciences, Johnson County Community College, 12345 College Blvd., Overland Park, KS 66210. Internet: **http://www.jccc.net/orgs/nars**

Taxi Drivers and Chauffeurs

(O*NET 97114)

Significant Points

- Taxi drivers and chauffeurs can work all schedules, including full-time, part-time, night, evening, and weekend work.
- Many people work in these jobs for short periods, so job opportunities will be good because replacement needs are high.
- Many taxi drivers and chauffeurs like the independent, unsupervised work of driving their automobile.

Nature of the Work

Anyone who has been in a large city knows the importance of taxi and limousine drivers. These drivers help passengers get to and from their homes, workplaces, and recreational pursuits such as dining, entertainment, and shopping. They also help out-of-town business people and tourists get around in new surroundings.

Taxi drivers, also known as cab drivers, usually spend most of their time cruising the streets to pick up fares. They drive taxicabs, which are most frequently large, conventional automobiles modified for commercial passenger transport.

At the start of their driving shift, taxi drivers usually report to a taxicab service or garage where they are assigned a vehicle. They record their name, work date, and cab identification number on a trip sheet. Drivers check the cab's fuel and oil levels, and make sure the lights, brakes, and windshield wipers are in good working order. Drivers adjust rear and side mirrors and their seat for comfort. Any equipment or part not in good working order is reported to the dispatcher or company mechanic.

Taxi drivers pick up passengers in one of three ways: cruising the streets to pick up random passengers; prearranged pickups; and pickups from taxi stands established in highly trafficked areas. The majority of passengers hail or "wave down" drivers cruising the streets, especially in urban areas. Customers may also prearrange a